More Data, Less Energy FACT SHEET

Key issue: The uptake and use of network-enabled devices such as set-top boxes, games consoles and computers is growing at a rapid rate. Network connectivity is quickly spreading to devices and appliances that were previously not network connected, such as TVs and even washing machines, refrigerators and lights. Network-enabled devices provide new functionalities for users but have a hidden energy cost, as they must be fully on to maintain network connection. The quantity of electricity used by each device is small but the anticipated massive deployment and widespread use makes the cumulative consumption considerable.

Growing uptake of devices connected to communication networks: The uptake and use in homes and offices of network-enabled devices such as set-top boxes, game consoles and computers is growing at rapid rate. There were already more than 14 billion network-enabled devices deployed globally in 2013 (equal to roughly two network-enabled devices for every person on the planet). Projections indicate that there will be 50 billion network-enabled devices deployed globally by 2020 and 100 billion network-enabled devices by 2030.

Growing electricity demand: The energy demand of network-enabled devices in homes and offices is growing at an alarming rate; it reached 616 TWh in 2013, surpassing the current electricity consumption of Canada. Based on a compound annual growth rate of 6% between 2014 and 2025, demand is expected to double in the next decade. Without concerted measures to improve energy efficiency, network-enabled devices used in homes and offices will use 1 140 TWh/year by 2025 (more than the current electricity demand of Russia).

Significant energy efficiency opportunity: Most of this electricity is used when these devices are not actually doing anything – merely maintaining network connectivity and waiting for network signals. Up to 80% of the electricity that some products use goes to maintaining network connectivity. The main reason is that current network communication protocols require that devices be on and responsive to remain part of the network. Also, energy consumption is not scaled to the communication work that devices perform, i.e. volumes of traffic transmitted.

Technical solutions exist to improve energy efficiency in network-enabled devices by allowing devices to power down, scale power demand to the activity that is performed, and maintain network connectivity with very low power consumption. IEA assessments indicate that the demand of network-enabled devices could be slashed by 65% by using best available technologies and solutions. Mobile devices are becoming increasingly energy efficient due to consumer demands for small size and long battery life. For example, there are smart phones that can maintain connectivity for as little as 0.5 mW. Meanwhile, some Internet-connected TVs draw in the region of 30 W when actively used and 25 W when not actively used, and set-top boxes (variations depending on type) draw around 16 W when actively used and 15 W when they power down.

Not implementing these solutions is a missed opportunity to reduce energy demand and consumer electricity bills. Globally, in 2013, 400 TWh could have been saved (corresponding to the annual electricity generated by 133 mid-size 500 MW coal-fired power plants) and consumer bills could have been reduced by USD 80 billion (assuming an average electricity price of USD 0.2 per KWh). Without implementation of comprehensive energy saving solutions, the amount of wasted electricity is projected to reach 739 TWh per year by 2025 -- more than the current total final electricity consumption of Canada, Denmark, Finland and Norway combined.

Need for policy interventions: Market drivers for reducing standby electricity consumption of most network-enabled devices are weak because this is an issue that consumers are not aware of and because the quantity of electricity used by each device is relatively small. Policies are needed to drive the uptake of energy efficient solutions. There are a number of policy options available to stimulate energy efficiency in this area including minimum energy performance requirements, labelling schemes, voluntary agreements, incentives and awards, consumer awareness campaigns. Some policy efforts are already underway (primarily in the Republic of Korea and the European Union, with some measures underway in the United States and Switzerland), but in most countries – this is still an area that has received no policy attention.